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| ISO 9001-2015 | Document No.: TM/SM/3 | Revision 02 | Date Effective From:16/06/2022 |
| Document Title: Specification of Powered Material Trolley | | | |



SPECIFICATION OF POWERED MATERIAL TROLLEY
(No. TM/SM/33 dt. 06.06.1996)
Second Revision, 2022)

Track Machines & Monitoring Directorate

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1.0 SCOPE:

This specification covers the functional and technical requirements with testing details of Powered Material Trolley. The Powered Material Trolley will be termed as 'Trolley' in this specification.

- 1.1 This specification covers performance requirements of Self Propelled Material Trolley in completely assembled and furnished conditions for operation on 1676 mm (Nominal) gauge on main line and branch line of Indian Railways.
- 1.2 This Material Trolley shall be Self-Propelled, light Weight, low cost trolley for easy & quick access to all work sites along railway track.
- 1.3 This trolley shall be used by P. Way Staff of Indian Railways for carrying Small Machine & Tools for day to day track maintenance operation.
- 1.4 The manufacturer may submit their own model/versions according to their specifications which can meet functional requirement as mentioned in this specification.
- 1.5 Preference to make in India: compliance of the instruction contained in public procurement (preference to make in India) order -2017 "Make in India" shall be ensured or latest instructions issued on subject shall be ensured.
- 1.6 Supplier is fully responsible to maintain the quality of product supplied to Indian Railways.

2.0 MATERIAL & CONSTRUCTION:

- 2.1 The Material Trolley shall be robust, sturdy, compact in design and capable of working in conditions mentioned under clause 4.2.
- 2.2 All hydraulic, electrical, electronic and mechanical control as well as parts such as pipes, wiring, cables, control panel etc. shall be interconnected and included in trolley as self-contained unit.
- 2.3 The Material Trolley shall be designed and constructed in such a way so as to ensure simple operation.
- 2.4 Engine:
 - i) The petrol/diesel engine shall be of reputed make, indigenously available and of proven performance in traction/automotive application.
 - ii) The engine shall be adequate power having sufficient reserve power to work in conditions mentioned under clause 4.2. The continuous rating of engine under standard I.S. conditions shall not be less than 4 HP.
 - iii) The engine shall be air cooled.
 - iv) A fuel tank of adequate capacity shall be provided for a run of 100 km.

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2.5 Transmission System: The transmission system shall be mechanical/hydraulic transmission through 3-speed gear box, hand operated and driving front/rear axles by means of gears.

3.0 FUNCTIONAL REQUIREMENTS:

3.1 The Material Trolley shall be self-propelled, powered by an air cooled diesel/ petrol engine or a light weight Generator Set.

3.2 The Material Trolley may be fabricated & constructed using light weight material like aluminum alloy. The self-gross weight of trolley shall not exceed 350 kg.

3.3 The pay load capacity of Material trolley shall not be less than 1.0 ton for transportation of tools, Thermit welding equipment etc.

3.4 It shall have easy on and off tracking facility. Preferably by a central turn table. For easy loading & unloading into breakeven, it shall be dismantlable at least in 3 parts.

3.5 The Material Trolley shall have a seat in the front to sit 1 + 2 nos. persons. The seat may have a provisional arrangement for sitting 3 more persons at the back of front seat. The seat shall be either collapsible or detachable. The seat should have a collapsible/ folding type hood/shed.

3.6 Two hooks for catching Gauge-Cum-Level shall be provided on the vertical posts of the hood/shed.

3.7 The platform may be of steel or aluminium chequered floor having an approx. Overall dimension of 2.0 m x 2.5 m approx. and should have maximum space for loading. The height of platform above rail level should be approx. 30 cm. The trolley shall have through axles with self-adjusting ball bearings & steel wheels.

3.8 The wheel dia of trolley shall be large enough to provide stability at designed speed of 30 kmph (min.) and capable of negotiating diamond switches.

3.9 The trolley shall be capable of running at designed speed in curves (up to & including 10 degree curves) and shall also be capable of negotiating points & crossing, diamond crossings, single/double slips at a speed of 10 kmph approx.

3.10 The wheels may be of cold pressed steel/forged steel/cast steel or light alloy wheels having a min. dia. of 300 mm.

3.11 The trolley shall have proper suspension system to give good riding quality in empty & fully loaded conditions at designed speed.

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3.12 The trolley shall have proper breaking system operated by foot pedal or mechanical hand break. Trolley shall also have mechanical parking brakes.

3.13 The trolley shall have the following accessories:

- i) Horn: Horn should be loud enough.
- ii) Flag fixing arrangement shall be provided for fixing flags (RED) during day time.
- iii) Pushing handles (two nos.) shall be provided to facilitate pushing the trolley manually in case of engine failure.

4.0 TECHNICAL REQUIREMENTS:

4.1 The trolley shall fulfil following requirements:

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| 1. | Track Gauge (Nominal) | : 1676 mm |
| 2. | Pay load capacity | : 1000 kg. |
| 3. | Seating capacity | : 3+3 = 6 persons. |
| 4. | Self-weight | : 350 kg (max.) |
| 5. | Speed | : 30 kmph (Min.) |
| 6. | Gear system | : 3 speed, 10, 20 & 30 kmph. |
| 7. | Reverse speed | : 5 kmph (min.) |
| 8. | Wheel base | : 1500 mm (Min.) |
| 9. | Lighting arrangement | : Head and tail lamps shall be provided to both the front and rear side of the trolley. |

4.2 The trolley shall be operatable in climatic conditions given below:

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| 1. | Atmospheric Temperature | : 0-55 ⁰ C |
| 2. | Altitude | : 0-300 m |
| 3. | Humidity | : 100% Saturation during rainy season |
| 4. | Rainfall | : Very heavy in certain areas |
| 5. | Atmosphere during (hot weather) | : Extremely dusty & desert terrain in certain areas. |
| 6. | Coastal Area | : Humid & Salt laden terrain. |

4.3 The design of trolley and its components shall confirm to IS/BS/ISO/IRS specifications wherever applicable.

4.4 The profile of wheels shall confirm to IRS profile.

5.0 Acceptance Test:

All arrangement to conducts Acceptance tests shall be made by manufacturer/supplier. Following acceptance test to be done on each trolley supplied:

5.1 Visual & Dimensional Check: The trolley shall be checked visually & dimensionally as per design, drawing & specification of manufacturer /supplier duly approved by RDSO. The trolley shall be free from all visual defects in material, construction & fabrication.

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5.2 Load test:

- i. The trolley shall be loaded with its designed pay load capacity and shall be run at a designed speed for 10-20 kmph. (Two Block Sections). The trolley shall run at a designed speed with adequate comfort without any problem in starting, breaking, stopping, change in gears and negotiation of points & crossings.
- ii. The trolley shall also be tested for 20% over load at a speed of 25 kmph in the manner as described in Para (i) above.

Note: While carrying out load test as mention in 5.0 and 5.2 in the station yard, running line, the instruction laid down in GR/SR, IRPWM and other Railway codes/ manuals shall be strictly followed. The assistances of competent supervisor (PWI/IPWM) from open line and help of traffic block etc. shall be arranged by purchaser.

6.0 Inspection:

The inspection of the Trolley shall be carried out by the purchaser Zonal railway or any representative/other agency authorized by purchaser/ zonal railway. The cost of inspection and testing shall be borne by the manufacturer/supplier. Minimum level of inspecting official shall be SSE.

- 6.1 All the materials, components, fittings, sub-assemblies etc. covered by the specification shall be subjected to inspection by the Inspecting officer, to be nominated by purchaser and shall be to his entire satisfaction.
- 6.2 The Trolley shall not be dispatched or packed until it has been passed by the inspection officer, such passing shall in no way exonerate the supplier/ manufacturer of his obligations in respect of quality and performance of the equipment.
- 6.3 The manufacturer/supplier shall provide all testing facilities including transportation that are required by the Inspecting Officer for proper inspection of Trolley. In case these facilities are not available at manufacturer's/ supplier's premises, he shall be required to get them arranged in the nearby test house or institution approved by the purchaser.
- 6.4 Each trolley will be subjected to acceptance tests mentioned in Para 5.0. If any trolley fails in any acceptance, same shall be rejected.
- 6.5 In the event of dispute between the Inspecting officer and the Supplier/ manufacturer, the decision of purchaser shall be final & binding.
- 6.6 Before offering the trolley for inspection, manufacturer/supplier himself check & test his trolley and ensure that it confirms to this specifications. A certificate to this effect shall also be given to Inspecting Officer.
- 6.7 Compliance of specification shall be verified at the time of inspection.

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7.0 WORKMANSHIP AND FINISH:

- 7.1 All the metal surfaces shall be properly finished, rough and sharp edges shall be removed.
- 7.2 All the working parts subjected to wear shall be accurately machined to such tolerances as will ensure the fitting of spares with minimum of adjustment.
- 7.3 Overall workmanship and finish shall be according to best trade practices.

8.0 TOOLS & SPARES:

Each trolley shall be supplied with a complete tools kit required by the operator in emergency and or normal working of the trolley. Any other spare as the manufacturer deems necessary for service/running of the trolley for twelve months initially.

9.0 WARRANTY & AMC:

- 9.1 Any part of the machine failing or proving unsatisfactory in service due to defective design, material or workmanship within 12 months from the date of commissioning shall be replaced by the supplier/manufacturer at his own expenses. If any design modification is made in any part of the equipment offered, the period of 12 months would commence from the date of such modification the modified part commissioned in service. The cost of such modification will be borne by the supplier.
- 9.2 During procurement of the Trolley, railways should go post-warranty AMC with the supplier as per IRSTMM.

10.0 DOCUMENTATION & INSTRUCTION MANUALS:

- 10.1 Detailed operating manual, maintenance, safety and service manuals shall be specifically prepared and two copies each of the same shall be supplied with each Trolley.
- 10.2 Frequency of various maintenance operations like servicing overhauling etc. shall be indicated by the supplier/ manufacturer.
- 10.3 **Maker's test certificate:** Copies of the maker's certificate guaranteeing the performance of the Trolley should be supplied in duplicate along with the delivery of each trolley.
- 10.4 **Drawings:** In order to facilitate subsequent maintenance in service, the manufacturer/supplier shall supply details drawings of the trolley exhibiting clearly the materials and dimensions.

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11.0 TRAINING AND COMMISSIONING:

Adequate demo and training in operation and maintenance of the Trolley shall be imparted to railway operators at the rate of one operator per Trolley by the manufacturer either at manufacturer's premises or at railway premises, as mutually agreed between the purchaser and manufacture/ supplier. The supply will be considered as complete only after this demo and training. Then will be completed the commissioning of trolley. Such demonstration shall be only for once for the entire lot of trolley (s) supplied together.

12.0 PROTECTION FROM RUST AND PACKING CONDITIONS:

All exposed surfaces shall be painted with red paint of standard quality to protect, it from rusting and other weathering effects. The trolley shall be supplied packed in suitable crates according to best trade practices to safely transport by rail/road and reach the consignee in safe and satisfactory manner. All the working parts shall be oiled before being assembled.

13.0 MARKING: The machine shall be legibly and indelibly marked with:

- i) Name, initials and trade-marks of manufacturer.
- ii) Contact no.
- iii) Serial number of machine.
- iv) Month & year of supply.
- v) Pay load capacity.

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